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have only seen a difference between them of size."—The occurrence of a venomous black spider is noticed at Berdiansk, amongst the wheat at harvest time. — Guyon writes on the parasitic Flea, or Chigoe, *Pulex* (Rhynchoprion) *penetrans*, which lives under the skin of man and pigs. Among its natural enemies is the Cockroach (*Blatta Americana*). The False Scorpion (*Chelifer cancroides*) is destructive to the common Flea.—Donné gives an account of some experiments conducted for the purpose of determining the possibility of spontaneous generation (heterogeny). Pasteur replies to these observations of Donné's, stating that his experiments are not free from many sources of error, and pronounces it as his fixed opinion, that, in the actual state of science, heterogeny is a chimæra.

NATURAL HISTORY MISCELLANY.

BOTANY.

CAN LICHENS BE IDENTIFIED BY CHEMICAL TESTS?—Some interesting experiments illustrating the differences in the chemical constitution of Lichens have lately been published (Regensburg Flora, 1866; translated by Rev. W. A. Leighton, in the Journal of the Linnean Society, of the same year) by Dr. Nylander, of Paris; and his observations have been followed by an extended application of one of the tests proposed to the large genus *Cladonia*, by Mr. Leighton (Annals and Magazine of Natural History, 1866), and by a general consideration of the described phenomena as recognizable in Spitzbergen species, by Dr. Theodore Fries (Lichens of Spitzbergen in Acta Holmiæ, 1867).

It appears, from these experiments, that Hypochlorite (Chloride) of lime furnishes "a sort of immediate analysis" of the colorable matter in *Roccella* (Archill of dyers) when applied, in solution, to the fronds; and the species which do not furnish this matter and fail therefore to exhibit the "erythrinic" reaction, or the presence of erythric acid (the case with our solitary, North American form) are of course in such way distinguishable from those which do. The same holds good in *Dirina*; in *Lecanora tartarea* (Cudbear of dyers) as compared with closely allied species, and in *Umbilicaria* and *Parmelia*, it being necessary in the latter that the inner, or medullary layer should be submitted to the test.

In like manner Hydrate of Potash is shown to effect several different reactions, according as the tissues subjected to it differ chemically. In most yellow *Parmeliei* (*Theloschistes*) and *Lecanorei* (*Placodium*) as in the red fruit of species of *Cladonia* and of *Biatora*, in *Heterothecium Domingense*, etc., the contact of the salt immediately induces a purplish tinge (supposed to indicate what has been called chrysophanic acid) and the species otherwise referable to the groups named which do not show this change (as *Theloschistes candelarius*) are thus elegantly, and sometimes

most conveniently, separable. So again, in many other Lichens (supposed now to contain usneic acid) as *Parmelia* and *Lecanora*, *Cladonia*, etc., the reaction, if it occur, is yellow, or greenish-yellow, and serves to separate, in this way, otherwise closely related forms. It is with the botanical value of these forms, sometimes so close that they were not before taken to differ even as varieties, but now assumed, and, in part at least, on no other than the kind of evidence above given, to be "species," that botanists are concerned.

I have gone through a large part of my North American and exotic Lichens in the light afforded by these experiments, and found the facts, if sometimes suggestive of more than is stated, generally clear; much clearer than the value attributed to them. Is it not indeed safe to say at once that species are not determinable, in Botany, by such tests? Dr. Fries has well pointed out the curious and significant parallelism running through *Cladonia*, wherein forms, agreeing in almost every other respect, are seen to differ, and in the same way, in their behaviour with potash; and his list of such forms might yet be extended. *C. delicata*, of the first series below, is complemented, it appears (Leighton's *Cladoniæ*, p. 6) by a *C. subdelicata*; and *C. athelia* bears, with little doubt, a similar relation to *C. Santensis*. Nor does there appear to be reason for estimating the value of the terms of these parallel series, as, for example,

Not tinged by Potash.	Tinged yellow by Potash.
<i>Cladonia gracilis</i> ,	" <i>Cladonia ecmocyna</i> ,"
<i>Cladonia degeneranis</i> , . . .	" <i>Cladonia lepidota</i> ,"
" <i>Cladonia subdelicata</i> ," . .	<i>Cladonia delicata</i> ,
" <i>Cladonia bacillaris</i> ," . . .	<i>Cladonia macilentata</i> ,

and so on, any higher or otherwise than in *C. furcata*; wherein we are told (Leighton's *Cladoniæ*, p. 9) Dr. Nylander does not consider the chemical difference which he regards as sufficient to separate "*C. ecmocyna*" from *C. gracilis* as indicating anything more than "only a distinct variety." Indeed it is difficult to see why *genera* (as for instance in the groups mostly characterized by a yellow thallus and polar-bilocular spores) should not be as properly determinable by these reagents, and nothing else, as species.

The observations cited are, however, plainly incomplete; and derive from this perhaps not a little of their interest. *Parmelia perlata* is thus said to differ specifically from its var. *olivetorum* Ach., by failing to show any red tinge with Chloride of Lime; the difference already recognized being regarded as sufficiently corroborated by the new one. But *all* specimens of *P. olivetorum* are not so distinguishable, as compare the excellent ones in Welwitsch's Portuguese collection, No. 75, and Massalongo's Italian, No. 325; and the assumed organic diversity thus failing, there is left only the (in itself uncertain) merely chemical one. It is much the same with *P. levigata* and its variety *revoluta* Nyl. (Synopsis, p. 385), the last being now taken, and on the same evidence, to be distinct in species from the first. We have here a better marked difference in botanical character,

one which commended itself as sufficient to Floerke, and, at one time, to Borrer; and there seems to be no doubt that this original *P. revoluta* Floerk. ! is discrepant from common states of *P. lævigata* in the chemical respect also. Yet this will not hold of the similar American lichen referred to the same variety, at the place cited, by Nylander, which shows no reaction; while, on the other hand, an European condition (Herbarium Krempelh.) is not wanting, associable far less with *revoluta* than with *lævigata*, the evident reaction in which favors the inference that the latter varies possibly in its chemical relations as much as the former; and that the new criterion is after all of no service. In all my numerous European specimens of *P. tiliacea*, the medullary layer is tinged red by the same salt, as stated by Nylander; but only two or three of the much more abundant North American ones show any trace of the reaction: the same discrepancy recurring in the intertropical forms, instanced by the var. *sublævigata* Nyl. (Lindig's Herbarium of New Granada), of which No. 110 of the second collection exhibits the coloration, while No. 736 fails to. Some of the specimens from this continent, showing no change of color, might indeed be referred or rejected to the conterminous *P. lævigata*; but surely not all: and it is safer to infer that the species before us furnishes only another example of the variableness of Lichen-groups in this respect. *P. caperata* is reckoned, by the same authority, among the species the medullary layer of which gives no indication of a red tinge with the reagent. I find yet the contrary the case in North American specimens, as well from Arctic America as from Texas; in Chilian and Peruvian ones; and in one said to be from Spitzbergen (Hookerian Herbarium), almost all these states being also marked by elevated, powdery margins,—as if a var. *ulophylla* (see Acharius) filled in this species an analogous place to the var. *olivetorum* in *P. perlata*,—but some (it is worthy of note) sufficiently normal. *P. Borreri* belongs, it is further said, to the number of species which exhibit the reaction; but none is observable in several well-marked North American specimens in my herbarium, and the same is true of the New Grenada *P. Borreri* Nyl. (Lindig's Herbarium, No. 735). The group represented by *P. physodes* is, on the other hand, set down as not affected by the salt in the way named. *P. Japonica*, of the present writer, belongs none the less to the group, and exhibits a free coloration. So *Dirina* is reckoned generally as displaying “a very distinct erythrinic reaction;” yet the Californian species (*D. Californica*) fails to respond to the test. A pale yellow tinge follows the application to the last-named Lichen, as in many other cases; but in what appears rather a corticoline form of *P. conspersa*, from Louisiana (var. *leucochlora* Nyl.), the change is to bright yellow not without orange, contrasting with the entire want of coloration in common states, and perhaps therefore not unworthy of note in the present discussion.

These results, given with due respect to the experienced authors whose observations have been considered, sufficiently indicate that the writer

inclines to emphasize the doubts with which Dr. Fries has received the supposed new criteria of distinction. It remains none the less likely, from what evidence we have, that the reagents named, capable as they are of instructive application to imperfect fragments of specimens, may sometimes afford clues to affinity where there is little to direct; and thus deserve a place beside the better-known solution of iodine, on our working tables.—E. TUCKERMAN, *Amherst*.

THE SUN-DEW A FLY-TRAP.—I wish to call the attention of botanists to a very humble little plant, the *Drosera rotundifolia*, or common sun-dew, which not only catches flies, but eats them. I was looking early in the spring in a swamp for chrysalids, when I noticed the tiny leaves of the sun-dew, which has beautiful blood-red glandular hairs, each tipped with a glistening dew-drop. The leaves were covered with the wings and legs of gnats. One or two had the hairs gathered into a knot at their centres, and on one a live gnat was struggling hopelessly to escape. I secured two plants and kept them for several weeks by laying the bit of moss on which they grew in a plate supplied every day with water. During this time I fed them with midges, ants, and beefsteak. The tiny drop of dew is glutinous, and any small insect touching them is lost. Every effort to escape but hurries its doom, and in a moment wings and legs are held fast to the tiny bristles.

Now begins the curious part of the affair. All the hairs begin to move towards the insect, but so slowly that their motion is almost imperceptible. In a few hours the hairs touch and cover it with their adhesive points. I placed a piece of raw beefsteak on the centre of a leaf. In twelve hours nearly every hair touched it. They gathered over it in knots and remained so for a day and a half, when they slowly returned to their natural position, leaving the beef a white sodden atom resting on the points of the hairs. I tried it with a bit of paper, but it refused to move for that; then a tiny fly was touched to one of the treacherous dew-drops, smothered, and in a few hours all the ferocious little scarlet hairs had their beaded points upon his body. When the blossom bud appeared, the glands no longer secreted the dew, and the leaves lost their brilliant color.—L. A. MILLINGTON.

TWO CROPS OF ROSES.—Another correspondent has mentioned a monstrosity in roses. I have a Provence rose which for three years in succession has borne numbers of flowers after its usual time of blooming. The late roses generally grow directly out of the old one until the third is produced. Some of them are perfect with the exception of the calyx, which is undeveloped; while others are a confused cluster of pink leaves, at the end of a stout stem.—L. A. M.

A WHITE WILD COLUMBINE.—One of your correspondents has spoken of finding Columbines that were nearly white. I believe they are not uncommon, as I have frequently found not only Columbines but *Lobelia cardinalis* of a delicate white or cream color.—L. A. M.